

1969

**OPERATING
SUMMARY**

MOORE TOWNSHIP (Corunna)

water pollution control plant

MOE
WPCP
MOO
ATIW

1969

c.1
a aa

LIBRARY COPY

MAK 25-1971

ONTARIO WATER
RESOURCES COMMISSION

ONTARIO WATER RESOURCES COMMISSION

Division of Plant Operations

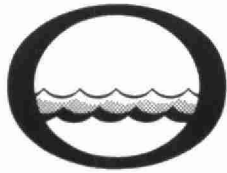
LABORATORY LIBRARY
ONTARIO WATER RESOURCES COMMISSION

Copyright Provisions and Restrictions on Copying:

This Ontario Ministry of the Environment work is protected by Crown copyright (unless otherwise indicated), which is held by the Queen's Printer for Ontario. It may be reproduced for non-commercial purposes if credit is given and Crown copyright is acknowledged.

It may not be reproduced, in all or in part, for any commercial purpose except under a licence from the Queen's Printer for Ontario.

For information on reproducing Government of Ontario works, please contact ServiceOntario Publications at copyright@ontario.ca



Water management in Ontario

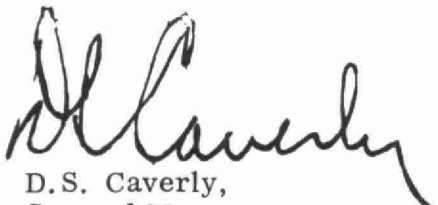
Ontario
Water Resources
Commission

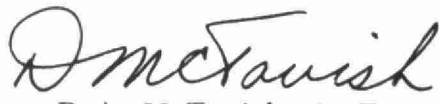
135 St. Clair Ave. W.
Toronto 195
Ontario

The operating efficiency and financial status of the water pollution control facilities operated for you in 1969 are presented in the following pages.

The regional operations engineer's comments and the statistical data will assist you in gauging the plant's level of performance. A new flow chart and up-to-date design data are also provided.

Various divisions and sections within the Commission have co-operated in providing what we trust is an accurate and concise annual operating summary.


D.S. Caverly,
General Manager.


D. A. McTavish, P. Eng.,
Director,
Division of Plant Operations.

MOE
SUPP
100
ATIN

CONTENTS

Title page.	1
Flow diagram	2
Design data	3
'69 Review	4
Project costs	6
Process data	9

ONTARIO WATER RESOURCES COMMISSION

CHAIRMAN
D. L. Collins

VICE CHAIRMAN
J. H. H. Root M. P. P.

COMMISSIONERS
H. E. Brown
D. A. Moodie
L. E. Venchiarutti

GENERAL MANAGER
D. S. Giverty

ASSISTANT GENERAL MANAGERS
I. J. Owens
K. H. Sharpe
F. A. Voegel
A. K. Watt

COMMISSION SECRETARY
W. S. MacDonnell

DIVISION OF PLANT OPERATIONS

Director
D. A. McEavish

Assistant Director
C. W. Perry

Regional Supervisor
P. J. Osmond

Operations Engineer
R. E. Brown

135 St. Clair Avenue West
Toronto 7

MOORE TOWNSHIP (CORUNNA)
water pollution control plant

operated for

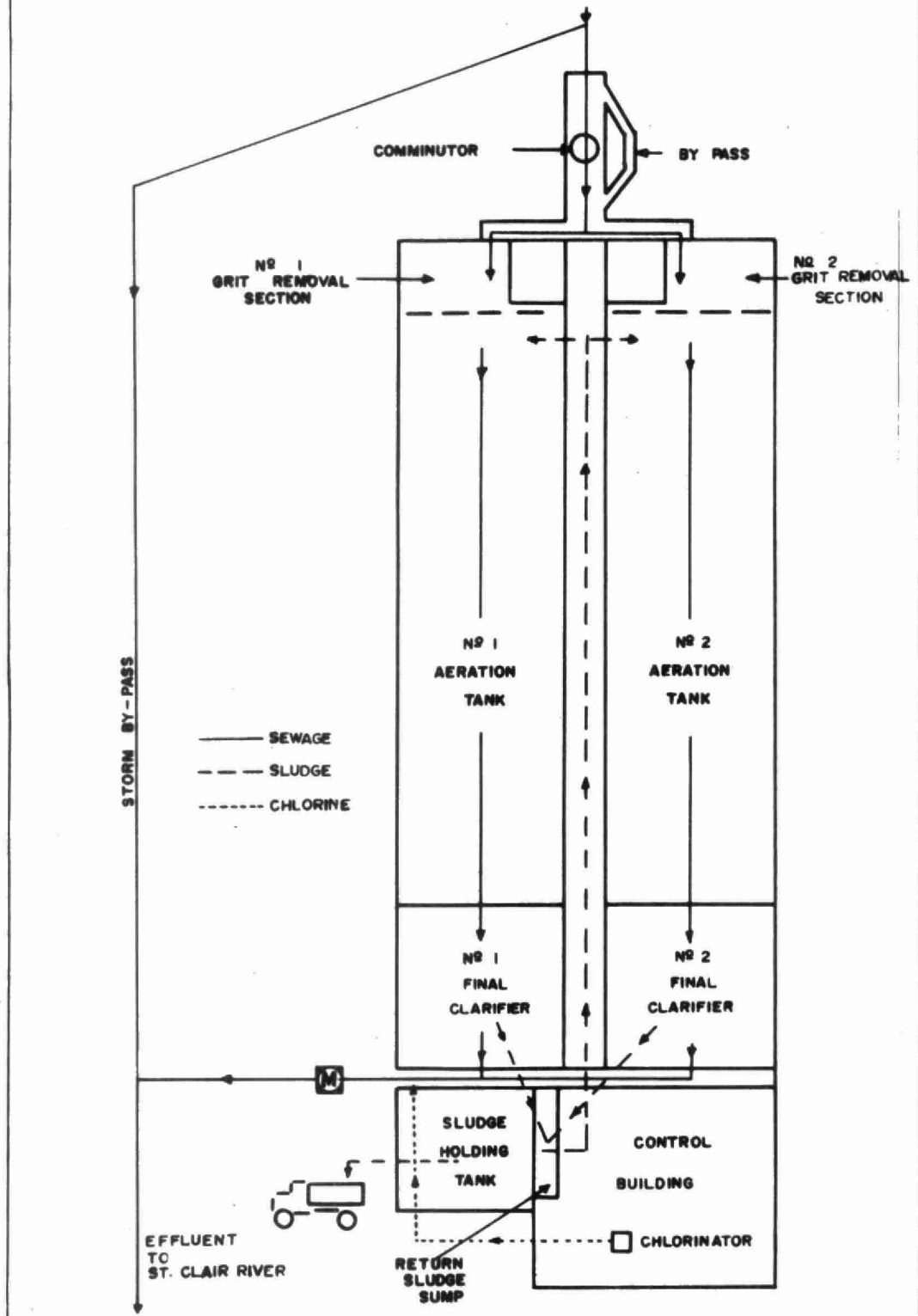
THE TOWNSHIP OF MOORE

by the

ONTARIO WATER RESOURCES COMMISSION

1969 ANNUAL OPERATING SUMMARY

MOORE TOWNSHIP (CORUNNA) WATER POLLUTION CONTROL PLANT



DESIGN DATA

PROJECT NO.	2-0088-61	TREATMENT	Extended Aeration
DESIGN FLOW	0.32 mgd	DESIGN POPULATION	4,000
BOD - Raw Sewage	150 mg/l	SS - Raw Sewage	150 mg/l
- Removal	90-95%	- Removal	90-95%

PRETREATMENT

Comminution

Type: Worthington comminutor
Size: One Model 15-C-4

Grit Removal

Type: C. P. Aer-Degritter with air lift
Size: 3780 gal
Retention: 17 min

SECONDARY TREATMENT

Aeration Tanks

Type: Diffused air, Single pass
Size: Two 84' x 17' x 14.25' (avg)
(40,698 cu ft or 254,000 gal)
Retention: 24.0 hours

Air Supply

Type: Sutorbilt
Size: Two 1000 cfm

Diffusers

Type: C. P. Spargers
Spacing: 22 per tank @ 20" c-c

Secondary Sedimentation

Type: Dorr
Size: Two 22' x 22' x 12½' swd
(75,300 gal)
Retention: 5.7 hours
Loading: Surface, 330 gal/ft²/day
Weir, 2,350 gal/ft/day

CHLORINATION

Type: W & T, Manual
Size: One 100 lb/day

Chlorine Contact Chamber

- in outfall

OUTFALL

196' of 48" dia corrugated pipe to
St. Clair River

SLUDGE HANDLING

Type: Sludge holding tank (decanted)
Size: One 17' x 17' x 15' (23,000 gal
@ 12.8' depth)

'69 REVIEW

The Moore Township water pollution control plant is of the extended aeration type rated at 0.32 mgd. Screening, comminution, grit removal, aeration, settling, chlorination, waste sludge storage and truck loading facilities are provided. The plant is located on the St. Clair River, upstream and upwind of the Police Village of Corunna, which it serves. Also included in the project is a complete sewer system and two automatic pumping stations equipped with submersible pumps. Only one half of the aeration section is now being used for treatment. The additional capacity is reserved for storage of storm flows.

During 1969 the final clarifiers were sand-blasted and painted, and the garage was wired for light and heat to provide winter usage.

Generally the plant was well run, and no major operating difficulties were experienced during the year.

PLANT FLOWS and CHLORINATION

During 1969, a total of 44.81 million gallons was treated at the plant. This represents an average daily flow of 120,000 gallons. The maximum day flow received was 220,000 gallons in January. The maximum flow for one month was 4.28 million or 140,000 gallons per day in March. Based on the March average, the plant operated at 44% of design capacity. Using the yearly average flow the plant operated at 38% of design capacity. The total flow for the year was 4% higher than in 1968.

Chlorination of the final effluent is carried out year-round. An average of 242 pounds of chlorine per month was required for an average dosage rate of 6.4 milligrams per litre, to maintain a residual of at least 0.5 mg/l.

PLANT EFFICIENCY

There was a decrease in the BOD and suspended solids concentrations to 190 mg/l and 158 mg/l from 1968 values of 214 mg/l and 248 mg/l respectively. This decrease is reflected in slightly lower concentrations in the final effluent. The percentage removal remained the same as the 1968 values of 95 and 93; this resulted in a decrease of 7% in BOD removed (75,600 lbs) and 29% in suspended solids removed (65,600 lbs).

The grit removal is the same as the 1968 values of nine cubic feet per month. However, it is six cubic feet per month lower than the 1967 value and is four cubic feet per month lower than in 1966.

EXPENDITURE

The total operating cost for 1969 was \$16,333.25, slightly lower than 1968's \$16,554.63. The cost per million gallons treated in 1969 was \$364.50, compared with \$414.50 in 1968. Although both preceding values were lower than in 1968, the cost per pound of BOD removed was 22 cents. The slight increase was due to the lower BOD loading.

SLUDGE DISPOSAL

The 458,000 gallons of waste sludge pumped to the holding tank were reduced to 134,000 gallons by aeration and decanting. An average of 3250 gallons of sludge per month was hauled away by tank truck for disposal on farm land, with the remainder being disposed of on the lawn inside the fenced area of the plant.

AERATION

In 1969, the MLSS were adjusted through a wide range of values in an attempt to improve the treatment results at the plant. It should be noted in a comparison of the effluent BOD and suspended solids with the MLSS concentration that usually the best results are obtained when the MLSS are kept high.

In 1969, 7260 cubic feet of air were required for each pound of BOD removed. This compares with the 1968 value of 7390 cubic feet and is normal for this system.

CONCLUSIONS

During the past year, a highly efficient treatment was maintained. The structures, equipment and grounds were well cared for and no serious breakdowns were encountered. The two final clarifiers were sandblasted and painted without disrupting the treatment process. The large quantity of waste sludge disposed of inside plant property reduced sludge haulage costs.

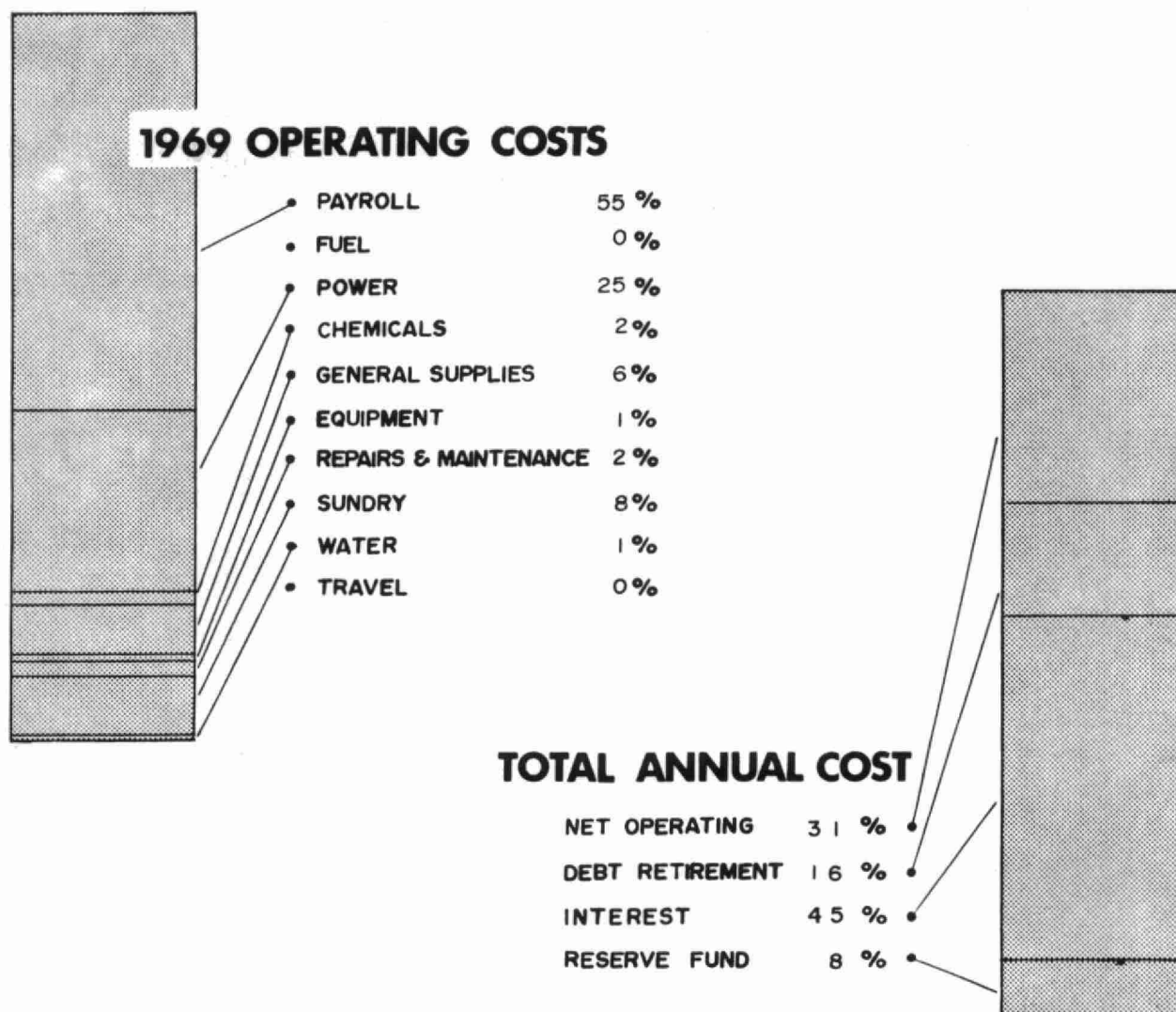
Because this plant is operating at a low hydraulic load factor of 0.38, expansion is not expected for a good many years.

PROJECT COSTS

NET CAPITAL COST (Final)		\$762,209.92
DEDUCT - Payments from Municipality	\$ 35,159.46	
- Portion financed by CMHC/MDLB (Final)	<u>300,550.70</u>	<u>335,710.16</u>
Long Term Debt to OWRC		<u>\$426,499.76</u>
Debt Retirement Balance at Credit (Sinking Fund) December 31, 1969		\$ <u>65,144.43</u>
Net Operating		\$ 16,333.25
Debt Retirement		8,610.00
Reserve		3,854.27
Interest Charged		<u>24,158.00</u>
TOTAL		\$ <u>52,955.52</u>

RESERVE ACCOUNT

Balance @ January 1, 1969	\$ 18,599.52
Deposited by Municipality	3,854.27
Interest Earned	<u>1,087.50</u>
	\$ 23,541.29
Less Expenditures	<u>2,489.44</u>
Balance @ December 31, 1969	\$ <u>21,051.85</u>



Yearly Operating Costs

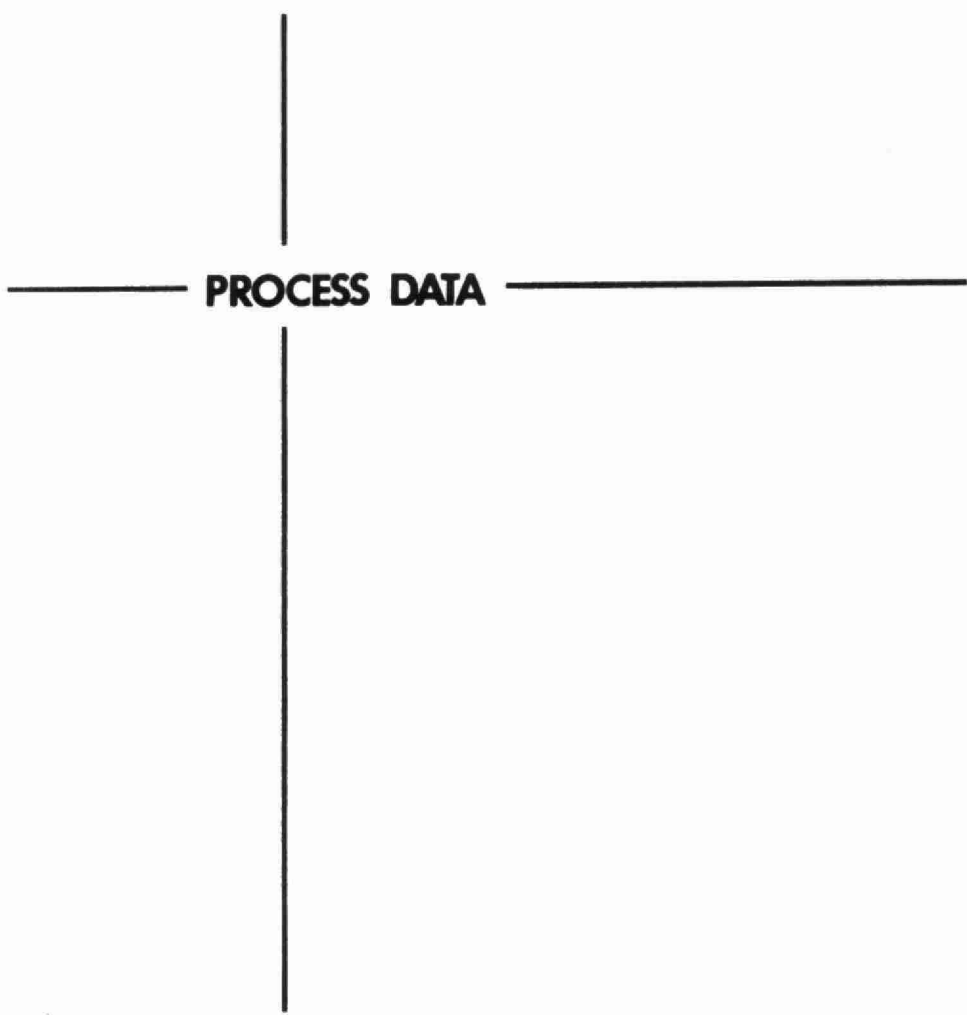
YEAR	MILLION GALLONS TREATED	TOTAL OPERATING COSTS	COST PER MILLION GAL	COST PER LB OF BOD REMOVED
1965	32.62	\$12,595.65	\$386.11	21 cents
1966	31.10	11,851.63	381.06	24 cents
1967	42.49	14,853.48	349.61	24 cents
1968	39.94	16,554.63	414.49	21 cents
1969	44.81	16,333.25	364.50	22 cents

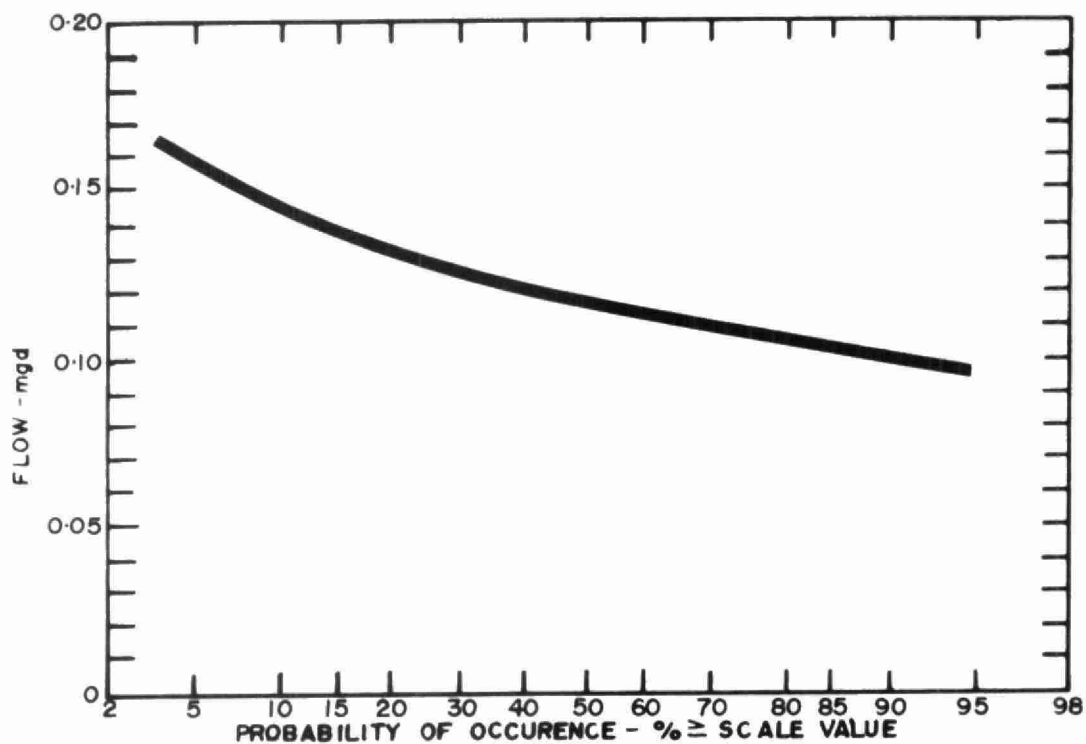
Monthly Operating Costs

MONTH	TOTAL EXPENDITURE	PAYROLL	CASUAL PAYROLL	FUEL	POWER	CHEMICALS	GENERAL SUPPLIES	EQUIPMENT	REPAIRS and MAINTENANCE	SUNDRY *	WATER	TRAVEL
JAN	1326.60	854.12	4.00	-	386.57	-	24.82	-	-	15.39	-	41.70
FEB	921.63	578.73	-	-	250.68	-	12.00	-	-	80.22	-	-
MAR	1038.51	578.73	97.17	-	219.26	-	47.58	-	-	95.77	-	-
APR	1053.93	732.24	-	-	546.18	-	-	-	-	41.91	-	(266.40)
MAY	1048.90	673.44	-	-	-	-	31.36	-	71.61	235.64	36.85	-
JUNE	1771.20	630.54	100.45	-	789.04	-	73.84	147.00	7.20	23.13	-	-
JULY	1864.78	603.97	120.25	-	379.80	354.38	212.56	-	-	113.91	38.81	41.10
AUG	1869.11	876.84	376.04	-	303.28	-	151.34	-	-	161.61	-	-
SEPT	1324.34	588.16	198.52	-	302.10	-	110.87	-	(40.00)	42.69	-	122.00
OCT	1634.14	598.80	170.04	-	315.98	271.70	51.03	-	106.25	21.69	44.10	54.55
NOV	930.99	598.85	37.25	-	303.88	(236.25)	103.05	-	82.71	41.50	-	-
DEC	1549.12	516.81	-	-	387.53	-	185.30	-	59.70	399.78	-	-
TOTAL	16333.25	7831.23	1103.72	-	4184.30	389.83	1003.75	147.00	287.47	1273.24	119.76	(7.05)

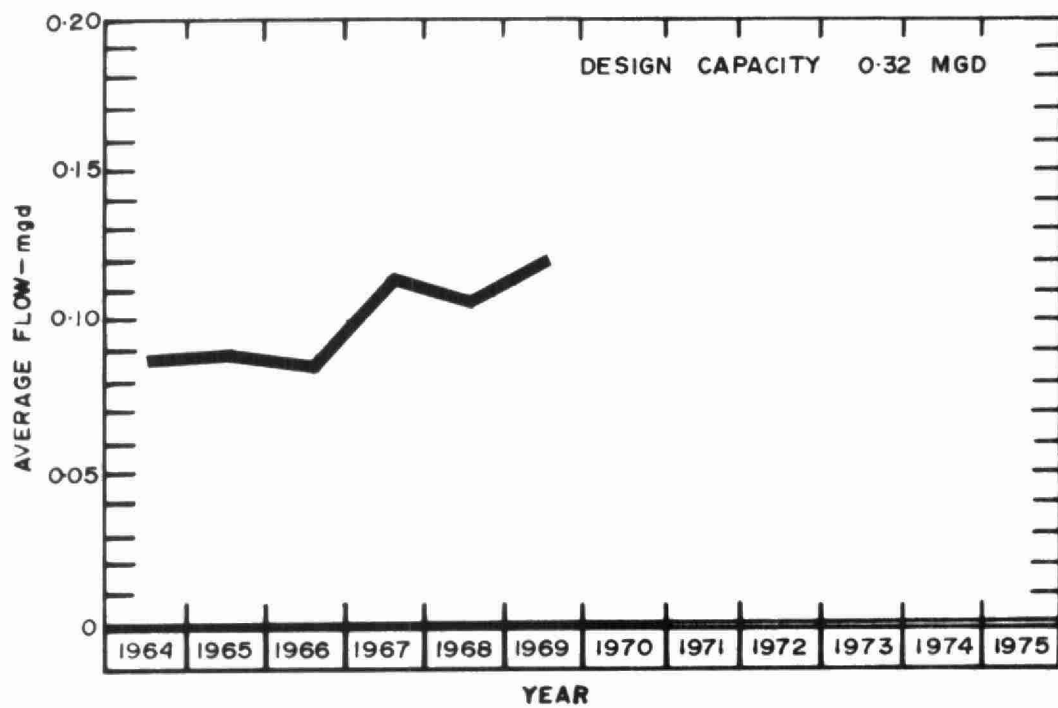
BRACKETS INDICATE CREDIT

* SUNDRY INCLUDES SLUDGE HAULAGE COSTS WHICH WERE \$544.00



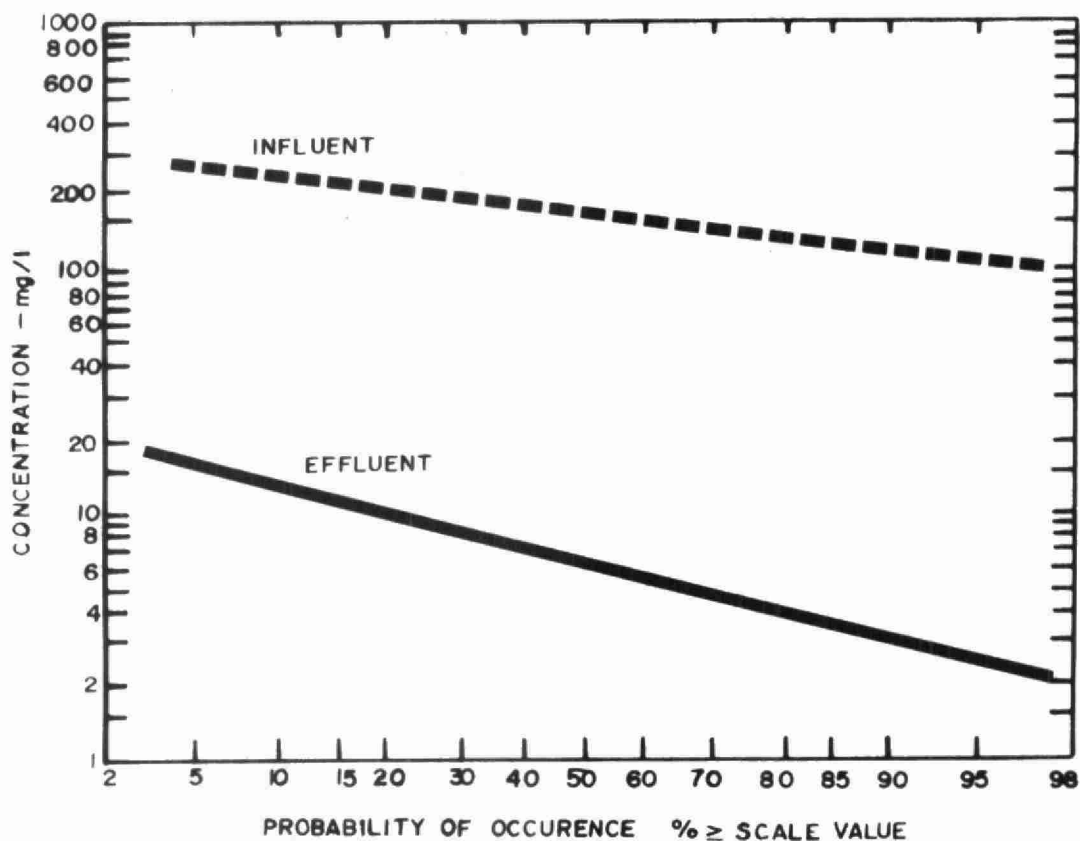


F L O W S

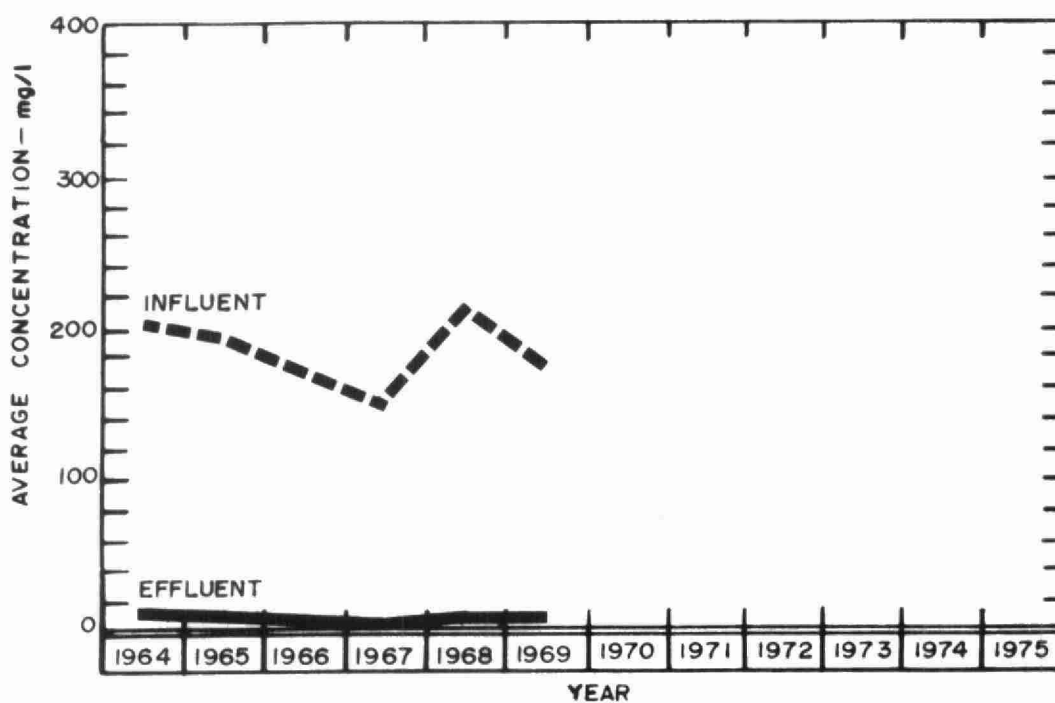


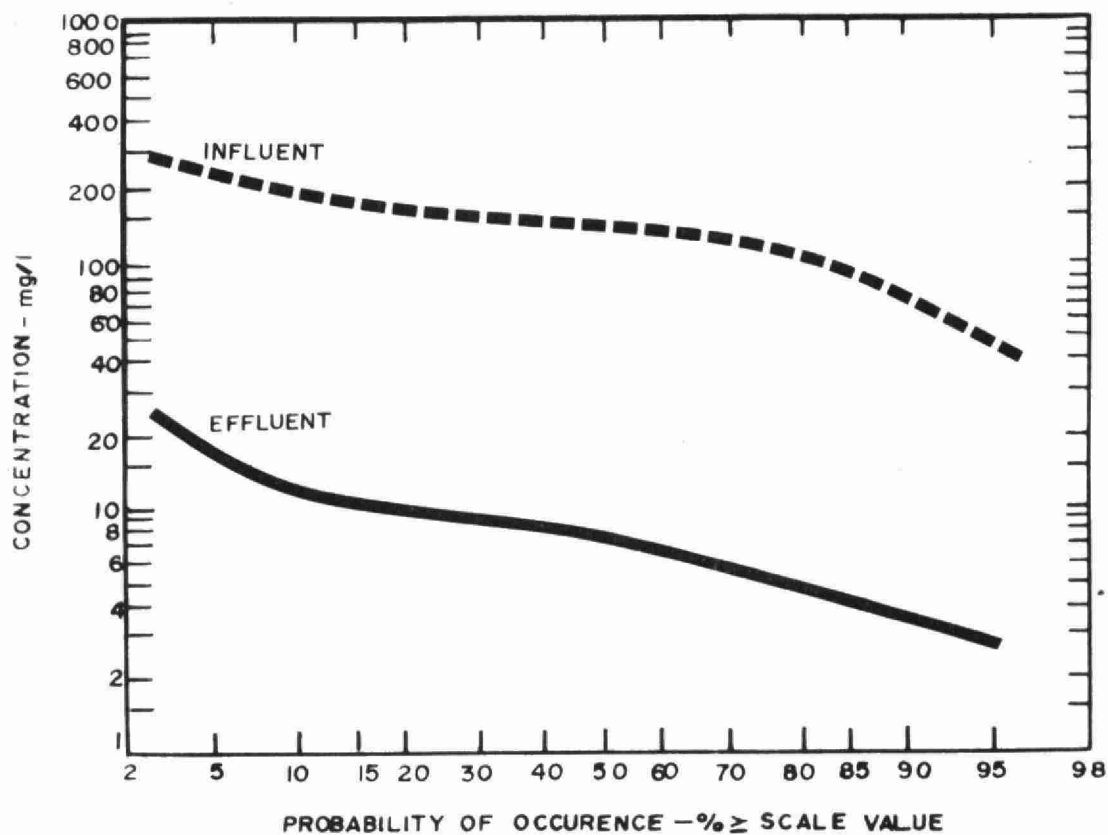
PLANT FLOWS and CHLORINATION

MONTH	TOTAL FLOW mil gal	AVERAGE DAILY FLOW mil gal	MAXIMUM DAILY FLOW mil gal	MINIMUM DAILY FLOW mil gal	CHLORINE USED pounds	DOSAGE mg/l
JAN	3.90	.13	.22	.10	155	4.0
FEB	3.17	.11	.13	.10	140	4.4
MAR	3.72	.12	.17	.10	155	4.2
APR	4.21	.14	.19	.11	150	3.6
MAY	4.28	.14	.21	.10	165	3.8
JUNE	3.64	.12	.16	.10	300	8.2
JULY	3.76	.12	.17	.10	310	8.2
AUG	3.80	.12	.16	.10	310	8.2
SEPT	3.42	.11	.14	.10	300	8.8
OCT	3.39	.11	.13	.09	310	9.1
NOV	3.64	.12	.21	.10	300	8.2
DEC	3.88	.13	.16	.10	310	7.2
TOTAL	44.81	-	-	-	2905	-
AVERAGE	3.73	.12	-	-	242	6.4

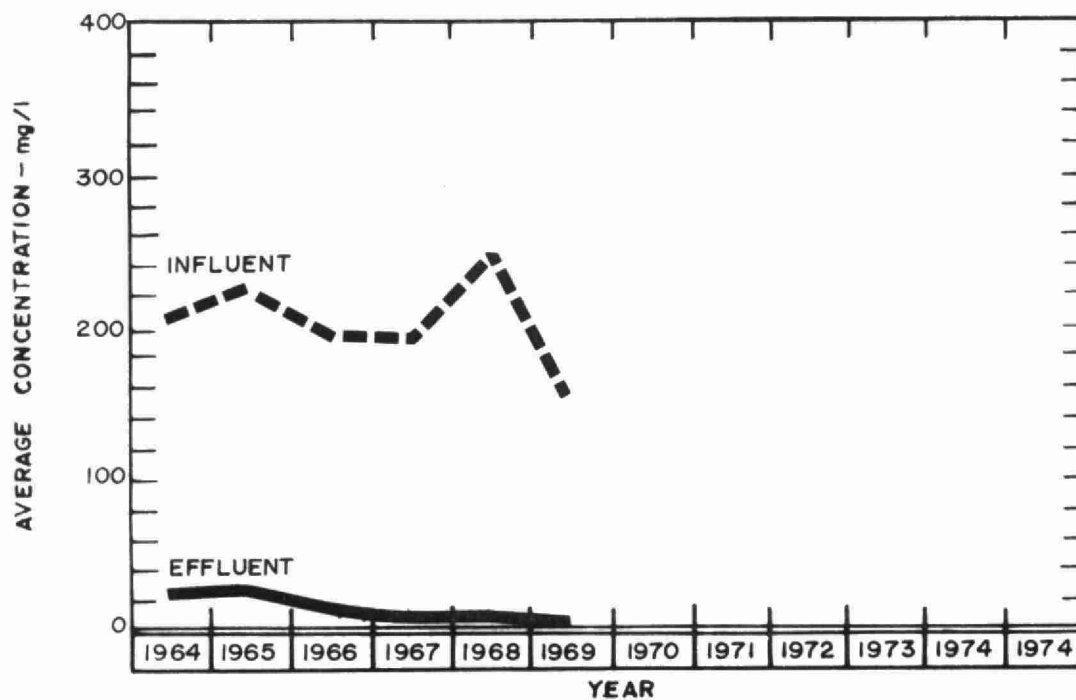


BIOCHEMICAL OXYGEN DEMAND





SUSPENDED SOLIDS



PLANT EFFICIENCY

MONTH	BIOCHEMICAL OXYGEN DEMAND				SUSPENDED SOLIDS				GRIT REMOVAL	
	INF.	EFF.	REDUCTION		INF.	EFF.	REDUCTION			
	mg/l	mg/l	%	10 ³ pounds	mg/l	mg/l	%	10 ³ pounds	cu	ft
JAN	187	12	93	6.8	280	7	98	10.6	9	
FEB	215	6	97	6.6	170	7	96	5.2	8	
MAR	191	7	96	6.8	172	8	95	6.1	9	
APR	178	7	96	7.2	150	10	93	4.9	8	
MAY	190	7	96	7.8	134	7	95	5.4	9	
JUNE	198	5	97	7.0	162	8	95	5.6	9	
JULY	126	6	95	4.5	124	7	94	4.4	8	
AUG	145	6	96	5.3	135	10	93	4.7	9	
SEPT	160	8	95	5.2	146	7	95	4.7	9	
OCT	158	9	94	5.4	121	10	91	3.8	9	
NOV	175	13	92	5.9	137	16	88	4.4	8	
DEC	190	8	95	7.1	158	9	94	5.8	9	
TOTAL	-	-	-	75.6	-	-	-	65.6	104	
AVERAGE	176	8	95	6.3	157	9	93	5.4	9	

SLUDGE DISPOSAL

Month	Sludge to Holding Tank (10 ⁴ Gals.)	Sludge Disposal (10 ⁴ Gals.)
January	4.60	0.80
February	4.50	0.00
March	4.20	0.94
April	5.28	0.81
May	5.10	1.08
June	5.90	1.35
July	3.30	2.00
August	4.00	4.00
September	3.60	2.00
October	1.30	1.50
November	-	0.00
December	4.10	0.00
TOTAL	45.88	13.40
AVERAGE	3.82	1.12

AERATION

MONTH	AVG DAILY FLOW mil gal	AERATION INF.		SECONDY. EFF.		MLSS CONCN mg/l	F/M lb BOD lb MLSS	AIR USED 1000 cu ft lb BOD	WASTE SLUDGE lb/DAY
		BOD	SS	BOD	SS				
		mg/l	mg/l	mg/l	mg/l				
JAN	.13	187	280	12	7	9010	2	6545	-
FEB	.11	215	170	6	7	8020	2	6101	-
MAR	.12	191	172	7	8	8370	2	6516	-
APR	.14	178	150	7	10	7180	2	6000	-
MAY	.14	190	134	7	7	7020	2	5714	-
JUNE	.12	198	162	5	8	5730	3	6101	-
JULY	.12	126	124	6	7	5580	2	9931	-
AUG	.12	145	135	6	10	4680	2	8421	-
SEPT	.11	160	146	8	7	4240	3	8372	-
OCT	.11	158	121	9	10	3730	2	8888	-
NOV	.12	175	137	13	16	5950	2	8323	-
DEC	.13	190	158	8	9	7740	1	6315	-
TOTAL	-	-	-	-	-	-	-	-	-
AVERAGE	.12	176	157	8	9	6437	2	7268	-

[illegible]

Environment Ontario



Laboratory Library
125 Resource Rd.
Etobicoke, Ontario M9P 3V6
Canada



96936000119216



Water management in Ontario